United States Department of the Interior
Bureau of Biological Survey
Necedah Migratory Waterfowl Refuge

QUARTERLY REPORT

May 1, 1939 - August 1, 1939

I General Weather Conditions

The Refuge has apparently been included in localized drougth area the past three months. This particular region has received very little rainfall, while regions to the north and northwest have received normal precipitation, and in some localities precipitation has been above normal.

Following is a summary of weather conditions for the past three months- (through the courtesy of the Mather U. S. Department of Agriculture Weather Bureau).

	Total Precip. (in.)	Greatest in 24 Hours		Temperatures Max.	Min.	Light Frost	Killing Frost	Prevailing Wind Direction
May	2.02	1.70	(May 28)	91	24	29	11, 12, 13	S & SW
June	4.13	1.19	(June 11)	91	37			S & E
July	2.69	1.98	(July 28)	98	62			S & E
TOTAL	8.84							

(Since appointment of Patrolman B. T. Carter (July 17) regular readings are being taken on flowages.)

The lack of rainfall has naturally affected flowage levels to a considerable extent. All flowages- Rynearson No. 1 and No. 2, 10, 13, 18, 19, 27, and 28 have remained close to flowage level or below during most of the three month's period. Both Rynearson flowages spilled slightly following the rain on June 11, but have remained several inches below flowage level since that time.

As indicated on the "Monthly Record of Flowage Levels" the W.P.A. dams impounding water in drainage ditches have also dropped. Stop logs have been removed on dams 4, 8, 9, 10, and 12, to help maintain normal levels in the Rynearson flowages. This procedure has not raised the Rynearson flowages, but it has prevented the pools from dropping to dangerously low levels, and by all appearances has more than made up for losses by evaporation.

At this date (August 9) flowages 10, 13, east part of 18, and 28, are completely dry, and the west portion of 18, 19, and 27, are considerably below normal flowage level.

Rynearson flowages are .3 to .4 feet below flowage level. Blue green algal has appeared in some of the shallow stagnated water, but as yet there seems to be no noticeable effect on plant life. Numbers of small bullheads and pickerel have died however, and is attributed to excessive organic decomposition and subsequent lack of oxygen.

Forest Fires

July 11, 1939- Sec. 15. T19N-R3E.

1/4 acre, set by train.

July 23, 1939- Sec. 22. T19N-R3E.

1/2 acre, set by train.

Very little damage was done on these fires, as they were immediately controlled by C.C.C. under supervision of the local State Ranger.

II Wildlife

A. Waterfowl

Species (summer residents) of waterfowl, shore birds, etc. are shown on the tabulations of census data. Method used in taking count, new records, nesting, etc. are also indicated in following pages.

Damage and complaint from nearby farmers- none.

Predation. Heavy predation of nesting birds occurred during the nesting season.

Species	Total No. Nests Found	Total No. Nests Destroy.	Predator	% Destroyed
Blue-Wing Teal	8	5	Skunk	62.5
Unknown (Perhaps Mallard)	7	2	Skunk	28.5
TOTAL	15	7		46.6

It was stated in the Annual Report (1938-1939) that it was expected to obtain additional information on nesting predation. Men assigned to the job originally however, did not continue the studies beyond June 19, and it was impossible to continue their work.

It is quite evident however, that nest predation by skunks is a limiting factor in production of waterfowl on the Necedah Refuge, and systematic control measures must be begun as quickly as possible.

There has been little evidence of severe predation by other species such as hawks, owls, etc.

The remains of one adult blue-winged teal (sex unknown), and one adult common mallard (sex unknown) were found during the month of May. Both birds had been killed by hawk or owl. One coot (juvenal) was found dead on a ditch bank- no signs of a predator; the bird had evidently broken its neck in some fashion or other as there were indications of hemorrhage.

Sickness. No evidence.

Parasites. Nothing but the ordinary feather lice as observed during banding operations.

Nesting data, as obtained by Soil Conservation Service game technicians, for the Rynearson Flowage is given in tabular form:

Nesting Site- Cover, etc.	Total Acres Covered in Survey	Total Nests Found	No. Nests by Species by Nesting Site (Cover, etc.)									
			Common Mallard	Blue-Wing Teal	Black Duck	Unknown	Grebe	Coot	Sharptail Grouse	Marsh Hawk	Blue Heron	
Dikes- sand, and annuals	.5	0										
Shorelines- heavy sedge, blueberry	12.0	1		1								
Islands, heavy June grass, sedge, blueberry Carex and willow	22.5	10	4	4		2						
Meadow Types- quack grass, bluegrass, woolgrass, sedges	22.25	2				1				1		
Adjacent Land- Aspen, oak, blueberry, recent burn	95.00	9		3	1				3	2		
Nests "floating"-of decayed cattail, sedge, etc.	Incidental	11					8	3				
Nest in tree	"	1									1	
TOTAL	152.25	34	4	8	1	3	8	3	3	3	1	

Nesting Census

Breaking down data as shown in the table, nesting density was as follows:

Species	No. Acres Per Nest	(Including islands, ditch banks and nesting habitat in vicinity of Rynearson Flowages)
Mallard	38.56	
Blue-Wing Teal	19.28	
Grebe	19.28	1 per 9.5 acres.
Coot	51.41	
Black Duck	154.25	
Unknown	51.41	
Blue Heron	154.25	
Marsh Hawk	51.41	
Sharptail Grouse	51.41	

A census was taken during the latter part of July by Refuge personnel with the idea of obtaining some idea as to comparative abundance of species, average number of broods, number of young per brood, preference as to site, etc.

The method used consisted of covering shorelines, and open water areas in early morning or late evening (4:00 A.M.-8:00 A.M. and 5:00 P.M.-8:00 P.M.).

Due to heavy cover in certain localities, and dense stands of brush and flooded timber it is certain that figures obtained are quite low. In many cases ducks could be heard in the dense brush and vegetation, but it was impossible to tally them as observations. It is believed that sufficient broods were observed to obtain data on average number of young, preferred localities, etc., and the census indicated certain facts that could not have been obtained by means of irregular observation.

Hens observed, that gave the usual exhibition of possessing young, were assigned brood numbers based on actual observation of similar species.

Although approximately twenty-five percent of the total area considered as waterfowl habitat on the Rynearson flowages was covered by means of hiking or by use of boat, it was impossible to census much of the most favorable habitat due to dense cover, etc.

The large scale map of Rynearson flowage was used in the field during the census-taking, and actual areas covered were marked on the map.

This area was computed by use of planimeter; the total area of what is considered as waterfowl habitat was also computed by use of planimeter, and a converting factor arrived at so that figures obtained for the area actually covered could be applied to the entire flowage area.

Following figures should be considered a low minimum, and apply to Rynearson flowages only:

TABLE NO. 1

Brood Census	Females		Males		Juvenal		No. of Broods		Sex & Age Undetermined		Average Brood Size	Acres Per Bird	Total	
	Actual Observation	Computed Total	Actual Observation	Computed Total	Actual Observation	Computed Total	Actual Observation	Computed Total	Act. Obser.	Com. Total			Actual Obser.	Comp. Total
Grebe	7	29	3	12	17	69	7	29	9	37	2.4	11.1	36	146
Coot	5	20	4	16	13	53	5	20	2	8	2.6	17.7	24	97
Sora Rail									2	8		215.1	2	8
Virginia Rail									4	16		107.6	4	16
Great Blue Heron					1	4			11	45		35.1	12	49
American Egret									5	20		86.0	5	20
Bittern									12	49		35.1	12	49
Black Tern									10	51		—	10	51
Little Green Heron									7	29		59.3	7	29
Mallard	7 2	29(8)	2	8	31(9)	126(37)	9	37	20	82	4.43	5.9	71	290
Black Duck	3	12			17	69	3	12	12	49	5.66	13.2	32	130
Wood Duck	2	8	3	12	8	33	2	8	4	16	4.0	24.9	17	6.
Blue-Wing Teal	5(1)	20(4)	5	20	27(3)	110(12)	6	24	22	90	5.4	7.05	63	244
Ringneck	1	4										430.2	1	4
Unknown Ducks									6	24		74.6	6	24
Solitary Sandpiper									7	29		59.3	7	29
Total		134		68		513		130		543		(Ducks Only) 2.26		

(No.) - Wild Mothers and computed young.
Conversion factor = 4.08 used in obtaining totals.

Total Adults..... 745
Total Adults and Juvenals.... 1258

Further systematic censusing of other flowages was impossible due to lack of sufficient transportation, and time.

Flowages 13 and 28 have been completely dry through the entire month of July, but occasional broods have been observed in nearby ditches.

Flowage No. 19 has dropped that the waterfowl habitat does not total over fifty acres. Other flowages have dropped so that at this date the total area of impounded water and marsh area (excluding ditches) equals about 2,300 acres.

This area added to the water impounded in the ditches (totaling about seventy-five acres- seventy miles of ditch averaging three yards in width) equals 2,375 acres of habitat favorable to waterfowl at this date.

Broods have been observed in ditches and the same per acre basis has been used to arrive at an estimate for the waterfowl population of the entire Refuge. It is realized that this method would not be entirely accurate from a scientific standpoint, as equal percentages of the various types of habitat have not been covered.

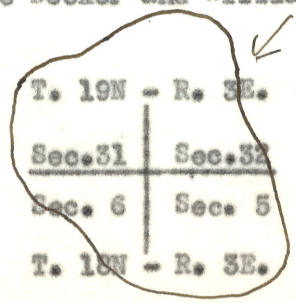
Estimate of waterfowl populations for Refuge area based on per acre figures of Rynearson flowage:

Species	Total Number Estimated (Including all sexes, age classes)
Grebe	250
Coot	150
Sora Rail	Common
Virginia Rail	Common
Great Blue Heron	80
American Egret	25
American Bittern	Very Common
Black Tern	Common
Little Green Heron	40
Common Mallard	400
Black Duck	180
Wood Duck	240
Blue-Wing Teal	350

Species	Total Number Estimated (Including all sexes, age classes)
Ringneck	10
Unknown	40
Solitary Sandpiper	Common
TOTAL	1765

Excluding all species but mallard, black duck, wood duck, blue-wing teal, ringneck, and unknown ducks, the total duck population is estimated conservatively at one duck per 1.1 acres. It is believed that, as the year's young become more capable of flight, and come into more open areas that future censuses will bear out the statement that the above figures are conservative.

Observations to-date indicate that the Great Blue Heron, Green Heron, American Bittern, and Black Tern are observed with about equal frequency in all parts of the flowage areas. Wood ducks seem to have concentrated in an area of 200 to 300 acres, with the focal point at the junction of the Becker and Williams roads (now under water).



This area contains a variety of food plants; cover graduates from sedge and cattail on up to flooded aspen and mature oak. Blue-wing teal select sites similar to the small potholes on both sides of the east Rynearson sand dike just south of the Becker road.

Mallards have apparently concentrated in the extensive marsh area in the north portions of both Rynearson flowages.

Grebe and Coots seem to prefer the more open waters, although they are also seen (or heard) among the flooded aspen.

Both rails have been observed among interspersed patches of dense Scirpus cyperus (wool grass) and open mud flats.

Egrets have been most frequently observed perched on some stub in the flooded timber. They have occasionally been observed in the potholes (open flats) along the Cover road.

Food habits of the waterfowl are speculative for the most part. Actual observations, of both blue-wing teal and mallards, feeding on floating duckweed, have been made.

Wide varieties of aquatics are available, and based on comparative abundance of these food plants it is believed that much of the food taken consists of wild millet, water smartweed, Potamogeton epihydrus, P. pusillus, P. natans, watershield, arrowhead, sedges, upland smartweeds, and a variety of aquatic insects and minnows.

List of available food plants on Necedah Refuge to-date:

Excellent	Abundance	Good	Abundance	Fair to Poor	Abundance	Undesirable	Abundance
(Najas sp.) Naiad	Rare	(Brasenia schreberi) Watershield	Common	(Scirpus validus) Softstem Bulrush	Rare	(Typha latifolia) Cattail	*
(Vallisineria spiralis) Wild Celery	Common	(Potamogeton pusillus) Pondweed	Abundant	(Sparaganium eurycarpum (?) Burreed	Rare	(Utricularia Sp.) Bladderwort	Abund.
(Zizania aquatica) Wild Rice	Rare	(P. gramineus)(?) Variableleaf Pondweed	Abundant	(Sagittaria latifolia) Arrowhead	Common	(Scirpus cyperinus) Wool grass	Abund.
(Z.aquatica augustifolia) Wild Rice	Abundant	(P.epihydrus) Pondweed	Common	(Panicum spp.) Panic grass	Common		
(Echinochloa crusgalli) Wild Millet	Common	(P.spp.) Pondweeds	Common	(Setaria lutescens) Pigeon grass	Rare		
(E.crusgalli framentacea) Japanese Millet	Rare	(Eleocharis pallustris)(?) Spike Rush	Common	(Anacharis canadensis) Elodea,waterweed	Common		
(E.walteri) Wild Millet	Rare	(Scirpus americanus) Three-Square	Rare				
(Polygonum amphibium) Water Smartweed	Common	(Spirodela polyrhiza) Big Duckweed	Rare				
(P. Spp.) (5 species) Smartweed	Abundant	(Lemna trisulca) Star Duckweed	Common				
		(L.minor) Duckweed	Abundant				

* Common to Abundant

Common grasses and sedges:

Andropogon scoparius-	Beard grass
Andropogon furcatus-	Beard grass
Panicum capillare-	Panic grass
Panicum tennesseense-	Panic grass

Panicum spp.-	Panic grass
Echinochloa crusgalli-	Wild Millet
Cenchrus carolinianus-	Sandbur
Zizania aquatica augustifolia-	Wild Rice
Agrostis hyemalis-	Hair grass
Agrostis alba-	Red top
Calamogrostis canadensis-	Blue stem
Danthonia spicata-	Wild oat grass
Eragrostis cileanensis-	
Poa pratensis-	Blue grass
Glyceria canadensis-	Manna grass
Scirpus cyperinus-	Wool grass
Carex scoparia-	Sedge
Carex spp.-	Sedge

Common Woody Plants:

Pinus banksiana-	Jack pine
Pinus strobus-	White pine
Pinus resinosa-	Red pine
Quercus alba-	White oak
Quercus rubra (?)-	Red oak
Quercus ellipicidalis (?)-	Black oak.
Populus tremuloides-	Quaking aspen
Populus grandidentata-	Large-toothed aspen
Salix spp.-	Willow
Alnus sp.-	Alder
Betula spp.-	Birch
Prunus pennsylvanicus	Pin cherry
Rosa sp.	Wild rose
Rubus spp.-	Blackberry & Dewberry
Vaccinium pennsylvanicum-	Blueberry
Gaylussacia sp.-	Huckleberry
Rhus spp.-	Sumac

Herbaceous Plants:

Ambrosia artemisifolia-	Common ragweed
Lespedeza spp.-	Bush clover
Chenopodium spp.-	Pigweed
Polygonum spp.-	Smartweed

B. Upland Game Birds

Following are population estimates of upland game birds for the past quarter:

Species	No.
Prairie Chicken	500
Sharptail	2000
Ringneck Pheasant	300
Bob White Quail	120
Ruffed Grouse	500

With sufficient cover, in the form of deciduous trees and shrubs, available in all areas but the open marshes, upland game birds are well dispersed at this time, and birds are found wherever favored food items are abundant.

All species are occasionally flushed from along roads or ditch banks where an abundance of smartweed (now ripe), blackberries, pin cherries, and other food plants occur.

Pheasants have been most frequently observed along the south and east boundaries, adjacent to meadows or cultivated fields.

Quail observations have been too scarce to justify any remarks on its preferences.

C. Predator and Rodent Control

The only predators taken during this quarter consisted of four (4) snapping turtles. At the present time ten turtle traps have been constructed, and six are in operation.

An intensive skunk-trapping program is contemplated, after policies concerning State authority are determined.

Control of snapping turtles is considered necessary. The four turtles taken were of large size and very capable of taking good sized ducklings. Frequent signs of large turtles have been observed on the sand dikes.

D. Fur take by Refuge personnel. Nothing.

E. Fur take by other trappers. Nothing.

F. Other Animals.

Species	Present Population	Comparison with Past Years
Deer	200	Signs of increase- good fawn crop or influx due to poaching
Snowshoe Rabbit	Very rare	Some increase.
Cotton-tail Rabbit	Rare to Common	Increasing noticeably.
Jack Rabbit	Rare	No sign of increase.
Red Squirrel	Abundant	No noticeable change.
Grey squirrel	Abundant	No noticeable change.
Fox Squirrel	Rare to Common	No noticeable change.
Coyote	8-15	Slight increase- natural increment of young.
Timber Wolf	None	No signs observed.
Black Bear	None	No signs observed.
Red Fox	6-14	Slight increase- natural increment of young.
Grey Fox	2-8	Slight increase- natural increment of young.
Beaver	130	Increasing- new dams, new cuttings.
Mink	10-20	Slight increase- natural increment of young.
Muskrat	2500	Increasing- new houses, increasing "signs".
Weasel	Common	Very likely increasing.
Skunk	Abundant	Increasing greatly- need control.
Otter	Rare 1-6	Too rare to be considered.
Fisher	Rare if any	Too rare to be considered.
Crow	Abundant	Increasing- will need control.
Hawks	Common	No signs of change in population.
Owls	Common	No signs of change in population- may need control.
Snapping Turtle	Abundant	Increasing greatly- control needed.
Snakes	Common	No signs of change in population.
Badger	Rare	No signs of change in population.
Raccoon	Rare	No signs of change in population.

Population of game species are estimates, based on observation frequency, last winter's strip censuses, and normal increase of the year's young.

Systematic censuses will be undertaken in the near future, to determine populations more accurately. A complete inventory of all wildlife (animal, bird, amphibian, reptile, insect and fish) will be undertaken by the Student Assistant during the next quarter.

G. Bird Banding Operations

Three traps have been in operation since July 30, 1939. All of these traps are located in the vicinity of the headquarters buildings, as any other location would mean possible theft from traps, by some of the lower human element.

Several locations are possible where chances of molestation are slight, and traps will be moved as soon as retakes become numerous, in present trap locations.

Following are trapping summaries up to July 31, 1939:

Species	Adult Male	Adult Female	Juvenal Male	Juvenal Female	Total Banded	RETAKES Adult Male	Adult Female	Juvenal Male	Juvenal Female	Total Retakes
Common Mallard	3	4	0	0	7	0	4	3	1	8
Wood Duck	3	0	7	5	15	0	0	0	0	0
Black Duck	0	1	0	0	1	0	0	0	0	0
TOTAL	6	5	7	5	23	0	4	3	1	8

It is quite certain that Blue-Wing Teal will make up a large portion of the banded birds, upon transferring the traps to sites where teal concentrate.

III Refuge Development and Maintenance

Emergency Spillways.

Upon Mr. William Taylor's recommendations the open spillways on Rynearson flowages No. 1, and No. 2, were widened to about a seven to one slope, and sheeting was placed at the toe. Heavy rock has been laid in place of the small rock originally in. This rock work was set up for completion by July 1, 1939, but due to a variety of reasons, the work was not completed. Six cubic yards of rip rap and ten cubic yards of small stone are at the site. Rynearson No. 2 spillway is complete.

Buildings.

Buildings at the secondary site are finished with the exception of the following: two coats of exterior paint, hanging doors on tracks, installing sash and trim, construction of inside louvre doors and gravelling floor.

The dwelling for the secondary site (renovated Speas house) has not been begun. A small amount of excavation work has been done.

Buildings at the primary site are complete except for the following: entire plaster job in the dwelling, all interior woodwork, including laying of the floor, hanging fixtures and doors, interior carpentry for built-in cabinets, and one coat of paint is necessary on all exterior woodwork. Concrete floors have not been poured in the basement, storage and coal rooms.

Service building. Work remaining to be finished: two coats of paint on exterior, windows to be placed, doors to be hung on tracks and all interior carpentry work in office.

Posting. Approximately three and one-half miles of posting remain to be finished. This job will be done by the Labor-Patrolman.

Boundary survey. At this date, June 10, Mr. Conrardy states that the entire boundary survey job will be completed by August 17.

B. Plantings

1. Aquatics and marsh plants.

All planting stock was treated in accordance with instructions received from the Washington Office.

To make certain that the Sago pondweed and bushy pondweed seed would remain "put", all seed was mixed in a heavy batter of clay, after the proper soaking period.

Good sites were available and a good growth is expected, although it is feared that a heavy carp population may prove a limiting factor to further propagation.

It might be added at this point that there is an abundance of the "upland" smartweeds occurring as natural growth throughout the area, and that no more seed be shipped in for planting; Polygonum amphibium and Muhlenbergia could be used to good advantage, however.

Aquatic Plantings

Species	Amount Planted	Type	Period Planted	Survival	Remarks
Wild Celery (Vallisineria Spiralis)	13.00	Seed Pod	Fall	?	Survival will be checked in July.
Smartweed (Polygonum penns.)	4.40	Seed	Spring	80%	Several good catches-expected that more will show up later in season.
Bulrush (Scirpus spp.)	1.31	Seed	Spring	?	Only a few signs of "catching", but more expected to show up.
Wild Millet (Echinochloa Crus-galli)	8.13	Seed	Spring	40%	Survival poor up to date. Too dry immediately following planting.
Sago Pondweed (Pot. pectinatus)	3.80	Seed	Spring	?	Too early to check survival.
Bushy Pondweed (Naias flexilis)	6.00	Entire Plant	Spring	?	Too early to check survival.
TOTAL	36.64				

Grain Crops

Species	Amount Planted	Type	Period Planted	Survival	Remarks
Rye & Millet	.50				
Fall Rye	32.0	Seed	Fall	80%	Planted by S.C.S. as "green manure" for corn field.
Spring Rye (Dikes)		Seed	Spring	30%	Most of seed blew off sand dikes before there was sufficient moisture.
Buckwheat	34.0	Seed	Spring	90%	Natural reseeding in one field.
TOTAL	66.50				

Trees and Shrubs

Mulberry	4,500	Seedling	?
Fox Grape	2,750	Seedling	40%
Elderberry	5,050	Seedling	50%
Hazelnut	350	Seedling	80%
Honeysuckle	110	Seedling	60%
TOTAL	12,760		

It is also recommended that bulrush rootstock be obtained, if possible, so that nuclei growth be assured. This is quite necessary due to the evident danger of cattail taking over every shallow water area in the flowages. Cattail control is of great importance- immediately.

Up-to-date past plantings of duck potato and duck weed (Lemna and Spirodela) have shown very good survival. Both blue-wing teal and mallard have frequently been observed feeding on the duck weed, and coot are also often observed among the extensive patches of duck weed.

Occasional growths of Brasenia and spatterdock are also showing up, but are not widespread as yet.

Potamogeton epihydrus and Polygonum emphibium have also appeared in scattered areas. P. epihydrus is quite common in ditches.

C. Collection. Nothing.

D. Distribution of seed and nursery stock. Nothing.

IV Public Relations

A. Recreational uses.

1. No public camp facilities available.

2. Fishing.

The Refuge policy to be set up for fishing is being formulated at the present time. Due to present accessibility of all parts of the Refuge area, and the network of public roads, no attempt has been made to curb the public from fishing.

Fishing for the most part has been confined to the immediate dam sites of Rynearson, and a one-half mile section of ditch located in Sec. 28. T19N-R3E.

It is estimated that approximately 2,000 man hours of fishing has occurred at the three localities mentioned. Based on local reports between three and four hundred pickerel and northern pike have been caught (mostly in the ditch); about one hundred and fifty bullheads (one-half to three-fourths lb. each) have been caught at the dams.

Bullheads are very numerous, but seem to run small in size. Some of the northern pike have weighed as high as nine pounds and have averaged three to four pounds as a rule. Fishing has been heavy on Sundays (all day), and evenings (6:00 P.M. to 8:00 P.M.).

3. Hunting. None legally.

4. Visitors.

Classification	No.	Official Station	Length of stay
C.C.C. Officials	1	Sparta, Wisconsin	.5
U.S.B.S. Officials	5	Washington, Des Moines, Ia. Milwaukee, Oshkosh, Wis.	11.0
S.C.S. Officials	2	Milwaukee, Wisconsin	2.0
Conservationists	4	Plainfield, Wisconsin Milwaukee, Wisconsin	5.0
Sightseers	120	Necedah, Juneau Co., Monroe Co. etc.	15.0
TOTAL	132		33.5

Most sightseers have been residents of Juneau, Monroe, Wood, and Jackson Counties, who have driven to the Refuge headquarters to see the captive geese.

B. Refuge Violations.

1. A Mr. William Cummings of Wisconsin Rapids, Wisconsin was apprehended for demolishing and transporting one of the barns located on the Refuge. An affidavit in which Mr. Cummings confessed to the act has recently been submitted to the Regional Office.

2. A Mr. Tony Svoboda of Finley, Wisconsin was apprehended cutting hay without a permit on Refuge land. The amount cut was determined and application for permit made out by Mr. Svoboda. Classed as unintentional trespass.

3. Mr. Walter Dziki was apprehended after cutting hay on Refuge lands without a permit. He has made application for the amount of hay taken.

4. Shooting has been heard in various parts of the Refuge and a regular morning and night patrol has been established in hopes of catching up to the trespasser.

V Economic Uses of Refuge

A. Grazing.

No permits have been issued for controlled grazing, but several farmers located adjacent to Refuge boundaries are grazing stock on Refuge lands. Until boundaries are fenced and a definite policy is set up it is thought best to attempt control only if the problem becomes serious.

One of the stock-owners has fenced in forty acres (with salvage fencing) of government land, and desires to obtain it on a yearly rental basis as soon as proper rates are determined.

Another stock-owned, possessing eighty acres of land within Refuge boundaries desires to rent an adjacent eighty acres of Refuge lands for grazing purposes.

Examination of pastures grazed in the past (Refuge lands) indicate that areas adjacent to ditches are not seemingly harmed by moderate grazing. Further study is necessary to determine commensurate rates of lease, camping facilities, etc.

B. Haying.

The following tabulations illustrate the status of haying under permit on the Necedah Refuge:

It is estimated that the fifteen individuals who have applied for permits, will cut approximately two hundred and fifty tons of hay, at the rate of $.50 per ton.

Due to lack of rain the total may be cut down to some extent, but a conservative figure for total revenue from haying permits is placed at $110.00.

C. Timber removal. None.

D. Share cropping. None. Possibilities for spring of 1940.

VI Other Items.

Goose flock. On July 18, a shipment of fifty Canada geese were received from the Bear River Refuge. Of the fifty geese received, seven were dead on receipt and four more died within a week's time.

At the present time the thirty-nine remaining geese seem to be in good health and are feeding well on various pondweeds (gathered daily), wheat, and a little corn.

An enclosure including a good sized area of water, and plenty of high knolls, and shade has been provided as a temporary pen. It is planned to construct a new pen, of eight foot game fence and enclosing about two hundred acres upon arrival of the C.C.C. camp.

Mapping of aquatics and upland vegetation, waterfowl banding, preparation of a herbarium, collection of aquatic insects, waterfowl censuses, and cataloging wildlife observations are being undertaken by the Student Assistant, Mr. George B. Fell.

On July 20 the writer observed the following species in approximately two and one-half acres of mud flat, sedge and cattail cover, and several small potholes:

American Egret-	4	(2 in flight)
Green Heron-	2	(both in flight)
American Bittern-	3	(2 feeding, 1 in flight)
Virginia Rail-	1	(feeding)
Blue-wing Teal-	2	(feeding)
Common Mallard-	4	(3 feeding, 1 in flight)
Solitary Sandpiper-	2	(feeding)

This is believed to indicate that favorable environmental conditions are present for a wide variety of shore birds, and waterfowl, and that the area will be highly productive in a comparatively short period of time.

Robley W. Hunt
Refuge Manager

Fatalities

Species	Date	Place	Cause of Death
Coot (Juvenal)	7/20/39	Ditch above bridge on Becker road.	Hemorrhage caused by injury to neck. No visible cut in skin.
Beaver (Adult)	7/24/39	Dam 8. L.Y.	Bloated.
Beaver (Young)	7/20/39	3/8 mi. NW of Dam No. 1	?
Turtles- 4 2 snapping 1 painted turtle 1 ?	8/3/39	Spring south of goose pen	?
Geese- Band No. 39-821138 " " 39-821140 " " 39-821147 " " 39-821162 " " 39-821186 " " 39-821164	7/18/39	Enroute	Dead when received.
" " 39-821171	7/22/39		
" " 39-821154	7/24/39	Goose Pen	?
" " 39-821178 " " 39-821157	7/28/39	Goose Pen	Liver was discolored by bile (?). No food in gizzard.

.Flowage No. 27- 50 acres of solid cattail. This flowage practically worthless for waterfowl.

Good catch of Polygonum pennsylvanicus planted spring 1939 on plowed site west of flowage No. 10.

Cattails taking over deeper water areas on flowage No. 19.

This field sowed to fall rye, 1938, for green manure came up with dense growth of smartweed (Polygonum lapathafolium ?). Characteristic of fallow fields in this area- excellent chicken country.

Food patch (4 acres) buckwheat, planted in spring of 1939. Excellent chicken country.

Showing excellent natural growth of smartweed as typical of most roadsides in area.

Showing good growth of Wild Rice
Planted Fall- 1938. Rynearson

Dense clump of Sc. validus (Rynearson
Flowage). (Water Smartweed in fore-
ground- natural), Sc.- planted 1938.

Showing natural spread of Wild Rice
Original planting made adjacent to
shoreline. Rynearson Flowage.

Showing excellent growth of Watershield
(Rynearson Flowage) Planted 1938

Water Smartweed (Natural propagation)
Rynearson Flowage

Duck Potato (4-5 ft. in height)
Rynearson Flowage. Planted 1938

Clump of Wild Rice on ditch bank- over 6 ft. in height. Leaves 2-3 inches wide. Rynearson Flowage.

Seeding sand dikes to rye as a fixative measure.

Native deer (doe)- upper center feeding along Bewick Trail.

(All pictures taken in July, 1939)

MONTHLY RECORD OF FLOWAGE LEVELS
Necedah Wildlife Refuge

Month July 1939

Date

Dam No.	Flow. Elev.	Dam Elev.		20th.	24th.	26th.	28th.	29th											
1	925.00	927.00		924.70		924.71	924.78	924.60											
2	925.00	927.00		924.68		924.67	924.68	924.77											
4	935.05	937.05		933.97	933.53		933.91	933.95											
8		945.37		941.12	946.46														
9		944.03		940.12	938.78														
10	935.73	937.73						936.50											
11	939.68	941.68						934.85											
12	940.45	942.01			937.74														
13	942.05	944.08				939.84													
14	944.05	946.05			941.05														
15	934.52	941.20	Washed		out			since	Sept.	1938									
16	941.64	943.64	Washed		Out			since	Sept	1938									
17	949.28	951.28			945.78														
18	946.80	947.97		946.30				946.37											
19	949.60	950.74		848.85				948.99											
26		953.52		949.77															
27	953.10	954.13		952.10				951.78											
28	954.30	955.18		952.61				952.28											
T.D. X						At Flowage level													